

REMARKS

Claims 1, 3-6, and 8-11 remain pending in this application with claim 6 being amended by this response. Claims 2 and 7 have been cancelled by a previous response. Support for the amendments can be found throughout the specification and specifically on page 6, lines 20-36 and page 7, lines 1-11. No new matter is added by these amendments.

Rejection of claims 6 and 8-10 under 35 U.S.C. 112, second paragraph

Claims 6 and 8-10 are rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 is rejected because the feature of separating the parameters renders the claim indefinite. Claim 6 is amended to correct a typographical error and clearly separate the features of separating and storing. Therefore, in view of the amendment to claim 6, it is respectfully submitted that this rejection has been satisfied and should be withdrawn. Claims 8-10 are dependent on claim 6 and therefore, the rejection of claims 8-10 has also been satisfied and should be withdrawn.

Rejection of claims 1, 6 and 11 under 35 U.S.C. 102(b)

Claims 1, 6 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by (E.D. Scheirer: "The MPEG-4 Structured Audio Standard" ACOUSTICS, SPEECH AND SIGNAL PROCESSING, 1998. PROCEEDINGS OF THE 1998 IEEE INTERNATIONAL CONFERENCE ON SEATTLE, WA. USA, 12-15 May 1998, vol. 6, pages 3801-3804, hereinafter known as "IEEE").

The present claimed arrangement provides a method for coding impulse responses of audio signals. The impulse responses allow the reproduction of sound signals corresponding to a certain room characteristic. Parameters representing an impulse response of a room for a sound source are generated. The parameters are inserted into multiple successive MPEG-4 PROTO-params fields. A first params field contains information about the number and content of the following params fields.

IEEE describes that the MPEG-4 standard defines numerous tools that represent the state-of-the-art in representation, transmission, and decoding of multimedia data. Among

these is a new type of audio standard termed "Structured Audio." The MPEG-4 standard for structured audio allows for the efficient flexible description of synthetic music and sound effects, and the use of synthetic sound in synchronization with natural sound in interactive multimedia scenes. A discussion of the capabilities, technological underpinnings, and application of MPEG-4 Structured Audio is presented.

IEEE neither discloses nor suggests "generating parameters representing an impulse response of a room for a sound source" as recited in claim 1 of the present arrangement. The subject matter of IEEE is based upon the Structured Audio standard specified in ISO/IEC 14496-3 subpart 5 (IEEE page 3801, col.1, paragraph [0002]). This standard describes the transmission of room impulse responses which make use of the Structured Audio Sample Bank Format (SASBF) in wavetables. Usage of the SASBF requires a structured audio implementation or "structured coding schemes" (IEEE page 3801, col. 1, paragraph [0002]). However, in the present claimed arrangement, it is possible to completely circumvent the transmission of impulse responses via SASBF by "generating parameters representing an impulse response." While IEEE describes "a block of sample data" that "might contain an impulse response" (IEEE page 3803, col. 1, paragraph [0002]), IEEE does not disclose or suggest actively "generating parameters representing an impulse response." Thus, IEEE neither discloses nor suggests "generating parameters representing an impulse response of a room for a sound source" as recited in claim 1 of the present arrangement.

In addition, IEEE also neither discloses nor suggests "inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields" as recited in claim 1 of the present arrangement. IEEE transmits impulse responses in a frame-like basis by using "blocks of sample data" which are received by a synthesis engine (IEEE page 3803, col. 1, paragraphs [0002] and [0003]). The synthesis engine then acts "roughly like a set of fixed synthesizers" by "receiving commands" and turning them into sound. Contrary to this, the present claimed arrangement uses the params array in order to transmit room impulse responses. IEEE does not contemplate the use of a params array to transmit room impulse responses, while in the present arrangement, parameters are inserted "into multiple successive MPEG-4 PROTO-params fields" in order to transmit coefficients of a room impulse response

in advance of effect rendering or synthesizing. This use of the params array is opposite to the originally intended manner, which is to transmit parameters for a real time control of effects on a frame-like basis. Since the “first params field contains information about the number and content of the following params fields” in a “multiple successive MPEG-4 PROTO-params field,” it is furthermore not necessary to implement the Structured Audio format of IEEE. Using only one params field allows for the “transmission of data of any length” and allows for the data to be “stored in an additional memory” to be “used during calculation of the effect” (page 7, lines 4-8). As a result, effects can be used on a proprietary basis, and can also be constructed to be backwards compatible to MPEG-4 players which use the Structured Audio format. Thus, IEEE neither discloses nor suggests “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement.

In the “Response to Arguments” section on page 9 of the Office Action, it is argued that “IEEE teaches a header (IEEE, pg. 3803, left hand column, ¶ 2) and directions showing how they are to be configured for a particular synthesis session where it is understood that the header includes such information since the header is ‘used to reconfigure the synthesis engine’ (IEEE, pg. 3803, left hand column, ¶ 3).” Applicant fails to see the relevance of the above citation and respectfully disagrees with the assertion that the citation in IEEE is relevant to the inserting step recited in the present claimed arrangement. The cited paragraphs describe blocks of sample data that “contain an impulse response that creates a particular reverberation effect ... Blocks of sample data ... may be transmitted in the MPEG-4 Structured Audio Sample Bank Format, or SASBF. A SASBF bitstream element contains several samples, simple parameters for algorithmic modification, and directions showing how they are to be configured for a particular synthesis session” (IEEE, pg. 3803, left hand column, paragraph [0002]). IEEE describes transmitting blocks of sample data (including impulse responses) into an MPEG-4 bitstream. However, IEEE is completely unrelated to the present claimed arrangement. In the present claimed arrangement, the parameters are inserted “into multiple successive MPEG-4 PROTO params fields.” IEEE, on the other hand, specifies that parameters for presenting an impulse response are inserted at an arbitrary place (i.e. SASBF) in an MPEG-4 bitstream. IEEE does not at all mention PROTO params fields.

Therefore, IEEE cannot disclose or suggest “inserting said parameters into multiple successive MPEG-4 PROTO params fields” as recited in claim 1 of the present arrangement. Similarly, IEEE neither discloses nor suggests the specific format used for the multiple successive MPEG-4 PROTO params fields i.e., “a first params field contains information about the number and content of the following params fields” as recited in claim 1. As argued above, IEEE is based on a structured audio implementation, where room impulse responses can be transmitted with the help of a so-called structured audio sample bank format (SASBF) in wave tables. In fact, the present claimed specification on page 2, lines 10-18 describes systems such as IEEE’s (i.e. use of a structured audio implementation for transmitting impulse responses) and offers improvements/replacements of such technologies.

Additionally, Applicant respectfully submits that IEEE does not use MPEG-4 PROTO params fields for transmitting impulse responses. Evidence indicating that IEEE does not disclose or suggest using the PROTO params fields can be found by looking at the Koenen reference, cited by the Examiner for the U.S.C. 103(a) rejection. Koenen gives an MPEG-4 overview in the official MPEG document published in March 2002. Koenen in section 10.6.1 (Advanced BIFS) on page 44 mentions that “the version 2 BIFS (Advanced BIFS) includes the following new functionalities: ... PROTOs and EXTERNPROTOs.” Furthermore, Koenen mentions in section 2 (Versions in MPEG-4) on page 10 that “MPEG-4 Version 1 was approved by MPEG in December 1998; Version 2 was frozen in December 1999.” On the other hand, the publication of Scheirer (the author of IEEE) was issued in May 1998. Therefore, IEEE was published even prior to the approval of Version 1 (not yet including PROTOs). Thus, IEEE cannot use MPEG-4 PROTO params fields because the technology was not yet invented at the time IEEE was published. IEEE neither discloses nor suggests “inserting said parameters into multiple successive MPEG-4 PROTO params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement. Consequently, it is respectfully requested that the rejection of claim 1 is satisfied and should be withdrawn.

Independent claim 6 contains features similar to those of claim 1 and is considered patentable for the reasons set forth above regarding claim 1. Therefore, it is respectfully requested that the rejection of claim 6 is satisfied and should be withdrawn.

Independent claim 11 provides the apparatus for the method of claim 1 and is considered patentable for the reasons set forth above regarding claim 1. Therefore, it is respectfully requested that the rejection of claim 11 is satisfied and should be withdrawn.

In view of the above remarks, it is respectfully submitted that the present invention is patentable under 35 U.S.C. 102(b) and that this rejection is satisfied and should be withdrawn.

Rejection of claims 3 and 8 under 35 U.S.C. 103(a)

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE in view of (Koenen, Rob. Coding of Moving Pictures and Audio: MPEG-4 Overview (V.21 – Jeju Version). Rep. No. ISO/IEC JTC1/SC29/WG11 N4668., International Organization for Standardization. 2002. 1-79, hereinafter referred to as “Koenen”).

Claim 3 is dependent on claim 1 and is considered patentable for the same reasons as claim 1. For the reasons presented above, IEEE neither discloses nor suggests the features of claim 1 of the present arrangement. Additionally, Applicant respectfully submits that Koenen, when taken individually or in combination with IEEE, does not disclose or suggest the features of the present claimed arrangement.

Koenen describes an overview of the MPEG-4 standard, explaining which pieces of technology it includes and what sort of applications are supported by it. Koenen, similar to IEEE, also neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement. Although Koenen (with IEEE) describes the scope and certain features of MPEG-4, it does not contemplate the use of “MPEG-4 PROTO” or “generating parameters representing an impulse response of a room for a sound source” as in the present claimed arrangement. Therefore, Koenen neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said

parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement.

Koenen merely mentions that “PROTOs” are one of the new functionalities for “version 2 BIFS” in section 10.6.1 on page 44. However, Koenen (with IEEE) does not describe any details of the PROTOs and does not disclose or suggest inserting impulse responses into the PROTOs, as in the present claimed arrangement. Therefore, Koenen (with IEEE) neither discloses nor suggests “inserting said parameters into multiple successive MPEG-4 PROTO params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement.

The combination of IEEE and Koenen, similar to the individual systems, also neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement. The combination of IEEE and Koenen merely describes the use of a Structured Audio format and other possible uses of MPEG-4 technology, but does not contemplate the direct use of the “params field” to transmit impulse responses. The present claimed arrangement, in contrast provides for “inserting said parameters into multiple successive MPEG-4 PROTO-params fields” which allows for the transmission of impulse responses without the use of SASBF. Therefore, the combination of IEEE and Koenen, similar to the individual systems, neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement.

As IEEE, taken alone or in combination with Koenen do not disclose or suggest all of the features of claim 1, it follows that since claim 3 is dependent on claim 1, claim 3 is

considered patentable for the reasons presented above regarding claim 1. Therefore, it is respectfully requested that the rejection to claim 3 is satisfied and should be withdrawn.

IEEE, taken alone or in combination with Koenen, also does not disclose or suggest all of the features of claim 6. As claim 6 contains features similar to those found in claim 1, claim 6 is considered patentable for the reasons set forth above regarding claim 1. As claim 8 is dependent on claim 6, claim 8 is considered patentable for the reasons set forth above regarding claim 6. Therefore, it is respectfully requested that the rejection to claim 8 is satisfied and should be withdrawn.

In view of the above remarks, it is respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of claims 4, 5, 9, and 10 under 35 U.S.C. 103(a)

Claims 4, 5, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE in view of Koenen in further view of (Scheirer, Eric D. "Structured audio and effects processing in the MPEG-4 multimedia standard." MULTIMEDIA SYSTEMS 7 (1999): 11-22, hereinafter referred to as "Multimedia Systems").

Claims 4 and 5 are dependent on claim 1 and are considered patentable for the same reasons as claim 1. For the reasons presented above, IEEE and Koenen, when taken individually or in combination, neither discloses nor suggests the features of claim 1 of the present arrangement. Additionally, Applicant respectfully submits that Multimedia Systems, when taken individually or in any combination with IEEE, does not disclose or suggest the features of the present claimed arrangement.

Multimedia Systems describes an overview of the "Structured Audio" and "AudioBIFS" components of MPEG-4, which enable the description of synthetic soundtracks, musical scores, and effects algorithms and the compositing, manipulation, and synchronization of real and synthetic audio sources. A discussion of the separation of functionality between the systems layer and the audio toolset of MPEG-4 is presented, and prospects for efficient DSP-based implementations are discussed.

Multimedia Systems, similar to the individual systems of IEEE and Koenen, neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement. Multimedia Systems merely provides a description of the Structured Audio components of MPEG-4. However, as stated above in the arguments regarding IEEE and Koenen, the present claimed arrangement provides a method that allows for the circumvention of transmission of impulse responses using Structured Audio. Thus, Multimedia Systems, similar to the individual systems of IEEE and Koenen, neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement.

Multimedia System and IEEE were written by the same author and were roughly published at the same time and use similar terminology; however, Multimedia Systems is only cumulative to IEEE. Multimedia Systems, similar to IEEE, does not at all disclose or suggest PROTOs. Similar to IEEE, Multimedia Systems describes the use of the Structured Audio Sample Bank Format (SASBF) and Structured Audio Orchestra Language (SAOL). The SASBF and SAOL are used to apply advanced effects by using custom filters or reverberators (*see* page 15, section 2.3.6). Further, Multimedia Systems recites:

“For one, it is a clear advantage to minimize the number of SAOL processes running, as they will often be the most computationally complex part of an audio system. If there are to be multiple Structured Audio processes (whether for decoding or for effects processing) in a terminal, they will each require a run-time package, and therefore either a multiple-DSP system or a multithreaded scheduler (on the DSP) must be used. Neither of these alternatives is practical today” (page 2, section 4.1, last paragraph).

The author of Multimedia Systems (and IEEE) realizes that the structured audio implementation for transmitting impulse responses described in the system is too complex for

practical use. However, contrary to the present claimed arrangement, the author of Multimedia Systems (and IEEE) did not come up with the solution for this problem. Even the combination of Multimedia Systems, IEEE and Koenen does not solve this problem and does not disclose or suggest the features of the present claimed arrangement.

The combination of IEEE, Koenen, and Multimedia Systems, similar to the individual systems, neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement. The combination of IEEE, Koenen, and Multimedia Systems, merely describes the use of a Structured Audio format and other possible uses of MPEG-4 technology, but does not contemplate the direct use of the “params field” to transmit impulse responses. The present claimed arrangement, in contrast, provides for “inserting said parameters into multiple successive MPEG-4 PROTO-params fields” which allows for the transmission of impulse responses without the use of SASBF. Therefore, the combination of IEEE, Koenen, and Multimedia Systems, similar to the individual systems, neither discloses nor suggests “generating parameters representing an impulse response of a room for a sound source” and “inserting said parameters into multiple successive MPEG-4 PROTO-params fields, wherein a first params field contains information about the number and content of the following params fields” as recited in claim 1 of the present arrangement.

As IEEE, taken alone or in combination with Koenen and Multimedia Systems, does not disclose or suggest all of the features of claim 1, it follows that since claims 4 and 5 are dependent on claim 1, claims 4 and 5 are considered patentable for the reasons presented above regarding claim 1. Therefore, it is respectfully requested that the rejection to claims 4 and 5 is satisfied and should be withdrawn.

IEEE, taken alone or in combination with Koenen, also does not disclose or suggest all of the features of claim 6. As claim 6 contains features similar to those found in claim 1, claim 6 is considered patentable for the reasons set forth above regarding claim 1. Since claims 9 and 10 are dependent on claim 6, claims 9 and 10 are considered patentable for the

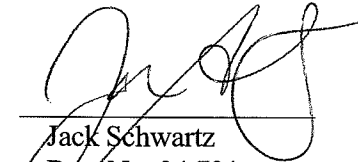
reasons set forth above regarding claims 1 and 6. Therefore, it is respectfully requested that the rejection to claims 9 and 10 is satisfied and should be withdrawn.

Having fully addressed the Examiner's rejections, it is believed that, in view of the amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at the phone number below, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No additional fee is believed due. However, if an additional fee is due, please charge the fee to Deposit Account 07-0832.

Respectfully submitted,
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